



Dear Student

The University of Plymouth is conducting a survey with sociology and politics students across the country regarding what they think of their course and the research methods they are taught.

We would be very grateful if you would complete this questionnaire telling us your honest views and experience.

All participants will be entered into a **FREE PRIZE DRAW** for Virgin gift vouchers, with a first prize of £75, plus other prizes of £25 and £15. We will use the data to produce an aggregate description of students' perspectives. All data will be treated as confidential and names will only be used to determine prize-winners.

Please complete the questionnaire in biro or pencil (not felt pen) and hand it back to your lecturer/tutor. Remember to fill in your name and your institution to be entered into the draw!

**THANK YOU - YOUR VIEWS ARE VERY IMPORTANT!**

## Student perceptions and experiences of quantitative methods Questionnaire

### Section 1: About you and your previous education

1. Are you:

• Male	<input type="checkbox"/>
• female	<input type="checkbox"/>

2. Did one or both of your parents/guardians study at a University, Polytechnic or other Higher Education institution (i.e. degree level or equivalent)?

• Yes	<input type="checkbox"/>
• No	<input type="checkbox"/>
• Don't know	<input type="checkbox"/>

3. a) What was the most recent qualification you obtained before entering your current course?

For example:

• A levels	<input type="checkbox"/>
• BTec	<input type="checkbox"/>
• Access/Foundation course	<input type="checkbox"/>
• Baccalaureat	<input type="checkbox"/>
• Irish Leaving Certificate	<input type="checkbox"/>
• Scottish Highers	<input type="checkbox"/>
• Degree/Direct entry	<input type="checkbox"/>
• Other (Please write in)	<input type="checkbox"/>

3. b) Did this qualification include passes in any of the following **selected** subjects?

(Please tick all that apply):

• Art	<input type="checkbox"/>
• Biology	<input type="checkbox"/>
• Chemistry	<input type="checkbox"/>
• Computer studies/science	<input type="checkbox"/>
• Design and Technology	<input type="checkbox"/>
• English	<input type="checkbox"/>
• Geography	<input type="checkbox"/>
• History	<input type="checkbox"/>
• IT/ICT	<input type="checkbox"/>
• Maths	<input type="checkbox"/>
• Media/Film/TV studies	<input type="checkbox"/>
• Modern languages (e.g. French, German, Spanish)	<input type="checkbox"/>
• Philosophy	<input type="checkbox"/>
• Physics	<input type="checkbox"/>
• Politics	<input type="checkbox"/>
• Psychology	<input type="checkbox"/>
• Sociology	<input type="checkbox"/>

4. Please write in your home postcode, or if you are a non-British student please write in your home country

5. Please tell us your age last birthday

## Section 2: About your current course

6. Which stage of your course are you currently in?

• One	<input type="checkbox"/>
• Two	<input type="checkbox"/>
• Three	<input type="checkbox"/>
• Four	<input type="checkbox"/>
• Other (please write in)	

7. a) Which of these are you studying?

• Single Honours, Major, or Joint Honours Sociology	<input type="checkbox"/>
• Single Honours, Major, or Joint Honours Politics	<input type="checkbox"/>
• Other (please write in)	

7. b) If you are studying a Minor subject, please write in the name of that subject

8. a) Why did you choose this particular degree course? (tick all that apply)

• It will help me get a good job	<input type="checkbox"/>
• Interest in the subject	<input type="checkbox"/>
• It has less emphasis on numbers than other subjects	<input type="checkbox"/>
• I got good grades in the subject at school/college	<input type="checkbox"/>
• Wanted to try something different at university	<input type="checkbox"/>
• I thought it would be an easy subject	<input type="checkbox"/>
• Encouragement from parents	<input type="checkbox"/>
• Encouragement from teachers	<input type="checkbox"/>
• Thought I'd enjoy it	<input type="checkbox"/>
• Other (please write in)	

8. b) Which one of the above was the most important for you? (Please write in)

9. Do you see your main degree subject as closer to Arts/Humanities or Science/maths? (Please indicate on the scale below to show where it falls)

Arts/Humanities  
(E.g. English,  
history, art)

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Science &  
maths

10. At a rough guess, which of the following best represents your *overall average* mark at the end of the last academic year?

• 0-39%	<input type="checkbox"/>
• 40-49%	<input type="checkbox"/>
• 50-59%	<input type="checkbox"/>
• 60-69%	<input type="checkbox"/>
• 70%+	<input type="checkbox"/>

### Section 3: About your perceptions of research methods

11. From the list below, please select all topics you have studied during your course, either currently or since your course began:

• Focus groups	<input type="checkbox"/>
• Participant observation	<input type="checkbox"/>
• Qualitative data analysis	<input type="checkbox"/>
• Quantitative data analysis using SPSS or Minitab	<input type="checkbox"/>
• Sampling	<input type="checkbox"/>
• Statistics using SPSS or Minitab	<input type="checkbox"/>
• Surveys and questionnaires	<input type="checkbox"/>
• Theory	<input type="checkbox"/>
• Unstructured interviews	<input type="checkbox"/>
• Using secondary data (e.g. Census data, British Crime Survey, General Household Survey etc.)	<input type="checkbox"/>

12. Did you find SPSS/Minitab:

• Easy to use	<input type="checkbox"/>
• Difficult to use	<input type="checkbox"/>
• N/A / haven't used it	<input type="checkbox"/>

13. Which of the following techniques have you heard of or studied?  
(Please select all that apply)

	a) Have heard of	b) Have studied or used
Standard deviation	<input type="checkbox"/>	<input type="checkbox"/>
Mean/median/mode	<input type="checkbox"/>	<input type="checkbox"/>
Cross-tabulations	<input type="checkbox"/>	<input type="checkbox"/>
Frequencies	<input type="checkbox"/>	<input type="checkbox"/>
Chi square	<input type="checkbox"/>	<input type="checkbox"/>
Sampling	<input type="checkbox"/>	<input type="checkbox"/>
Bar charts/Pie charts	<input type="checkbox"/>	<input type="checkbox"/>
t-tests	<input type="checkbox"/>	<input type="checkbox"/>
z-tests	<input type="checkbox"/>	<input type="checkbox"/>
Histograms/Scattergrams	<input type="checkbox"/>	<input type="checkbox"/>
Correlation	<input type="checkbox"/>	<input type="checkbox"/>
Cramer's V	<input type="checkbox"/>	<input type="checkbox"/>
Hypothesis testing	<input type="checkbox"/>	<input type="checkbox"/>
Pearson's r	<input type="checkbox"/>	<input type="checkbox"/>
Spearman's rho	<input type="checkbox"/>	<input type="checkbox"/>
Regression	<input type="checkbox"/>	<input type="checkbox"/>

14. Do you agree or disagree with the following statements?

	Agree	Disagree	Not sure
On the whole I have enjoyed my degree so far	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My degree will help me get a good job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I enjoy learning about surveys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had a bad experience of maths at school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The idea of learning statistics makes me feel anxious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I didn't expect to have to do so much number work on this degree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sociology as a subject has less status than the physical sciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
On the whole I'm good at maths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Employers see sociology as a good degree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
One of the reasons I chose this degree is because I don't like maths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sociology is considered a feminine subject	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Science is given too much prominence in our society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't think sociology students should have to study statistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using statistics detaches you from your research topic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I'd rather write an essay than analyse data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Qualitative methods tell us more about the social world than quantitative methods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maths ability enables students to cope better with statistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
On the whole, you can't trust statistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. How important are the following to your learning success in quantitative methods (i.e. statistics, data analysis, surveys, sampling)? (Please rate each on a scale of 1 to 10, where 1 is unimportant and 10 is very important)

• Chance to actively engage in class	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Small classes	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Having some maths ability	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Regular feedback	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Access to tutors	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Access to online 'teach yourself' materials	1	2	3	4	5	6	7	8	9	10
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Which do you find most difficult?

• Quantitative methods (e.g. statistics, data analysis, surveys, sampling)	<input type="checkbox"/>
• Qualitative methods (e.g. interviewing, focus groups, observations, case study, documentary analysis)	<input type="checkbox"/>
• Both about the same	<input type="checkbox"/>

17. If you have had some difficulty with quantitative methods at University, what would you say has been the main reason?

18. How could teaching and learning in quantitative methods (statistics, data analysis, surveys, sampling) be improved?

19. Most students find some topics are more challenging than others. In the list below, please rate each topic as to how easy or hard you found it.

	Very easy	Fairly easy	Fairly hard	Very hard	Can't remember/ Haven't studied it
Standard deviation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mean/median/mode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-tabulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chi square	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sampling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bar charts/Pie charts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t-tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z-tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Histograms/Scattergrams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correlation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cramer's V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypothesis testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pearson's r	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spearman's rho	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. When you were learning quantitative methods at University, were you mainly taught by a lecturer who was:

• a sociologist or political scientist	<input type="checkbox"/>
• a statistician or mathematician	<input type="checkbox"/>
• neither	<input type="checkbox"/>
• don't know	<input type="checkbox"/>

21. What is your overall average mark in your *research methods* modules?

• 0-39%	<input type="checkbox"/>
• 40-49%	<input type="checkbox"/>
• 50-59%	<input type="checkbox"/>
• 60-69%	<input type="checkbox"/>
• 70%+	<input type="checkbox"/>

22. How *relevant* are the following topics for learning about the *rest* of your main degree subject (e.g. sociology or politics)?

	Very Relevant	Slightly Relevant	Not Relevant	Haven't Studied it
Standard deviation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mean/median/mode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cross-tabulations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frequencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chi square	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sampling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bar charts/Pie charts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
t-tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
z-tests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Histograms/Scattergrams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Correlation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cramer's V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hypothesis testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pearson's r	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spearman's rho	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. Could you please tell us which of the following categories best applies to you?

White (British; Irish; Any other White Background)	<input type="checkbox"/>
Mixed (White and Black Caribbean; White and Black African; Any other mixed background)	<input type="checkbox"/>
Asian or Asian British (Indian; Pakistani; Bangladeshi; Any Other Asian background)	<input type="checkbox"/>
Black or Black British (Caribbean; African; Any other Black background)	<input type="checkbox"/>
Chinese	<input type="checkbox"/>
Other ethnic group (please write in)	

To be entered into the prize draw, we will need your name and the name of your University/College. We will notify prize-winners via their lecturers/tutors.

Your Name:
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Name of University/College:
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**Thank you for taking the time to complete this questionnaire.**

## ACTIVITIES AND ACHIEVEMENTS QUESTIONNAIRE

### 1. Non-Technical Summary

A 1000 word (maximum) summary of the main research results, in non-technical language, should be provided below. The summary might be used by ESRC to publicise the research. It should cover the aims and objectives of the project, main research results and significant academic achievements, dissemination activities and potential or actual impacts on policy and practice.

#### **The issue:**

As part of the wider concern about skill levels in the labour force, social scientists have identified a shortage of graduate researchers with competence and motivation to work with numerical and statistical data. Lecturers teaching social research methods to undergraduates have also for some time expressed anxieties about their students' performance in handling such quantitative techniques. ESRC addressed this by reforms to postgraduate training, designed to broaden and strengthen the range of research techniques learned. While progress has been made, concerns remain that the number-skills deficit remains, reflected in the dependence on non-numeric techniques in British sociology.

A literature review and prior communications with research methods lecturers showed that this debate has largely been conducted on an anecdotal and 'common sense' basis. In most countries and certainly in England and Wales, there had been no systematic research. Evidence-based knowledge was lacking. For example, what proportion of undergraduates actually experience difficulties in acquiring quantitative analysis skills? Does this apply equally to students reading sociology and political science, and is it a nationwide problem? The current project is the first attempt to collect data providing a reliable national picture. The findings are set in the context of students' direct educational experience, including degree subject choice, teaching, and academic achievement levels.

#### **Data Collection**

Data were collected using two main methods. In November 2005 discussions were held with small groups ('focus groups') of Stage Two and Stage Three students in three institutions. The student participants reflected on their personal experiences of learning mathematics in secondary school, their choice of disciplines through A Level into Higher Education, and what they had learned about quantitative techniques in their social research methods modules. They were encouraged to express their attitudes towards this experience and quantitative work itself. This exercise helped the researchers to design the questionnaire used as the second method of data collection. It also provided concrete individual examples with which to illustrate the students' processes of learning.

The questionnaire used in the second part of the project, carried out early in

2006, was designed as a self-completion, on-line form. In addition to the topics mentioned above in the focus groups, students' views were sought about sociology's status and whether they saw it as closer to the arts and humanities, or the sciences and maths. A random sample of 34 old and new universities and university colleges offering major/ single honours sociology/ politics was selected. In each institution, all Stage 2 and Stage 3 sociology and politics undergraduates were sent an explanatory email by one of their own members of staff, explaining the study and containing a URL link to the questionnaire.

The survey was designed to provide national coverage and thus a representative account of students who were taking sociology and politics. However, the initial number of responses to the online questionnaire was quite low (particularly from politics students) and a 'booster' sample of paper-based questionnaires was distributed in those universities where the response was poor. The final achieved sample showed no significant institutional or gender differences. We chose to present our findings mainly as cross-tabulations so that they would be understood by as wide an audience as possible (although further cluster analysis is in hand).

### **Findings**

Twice as many students had taken arts/ humanities A Levels as science or technology subjects: 70% had taken sociology, 63% English and 35% psychology, the most popular combination being sociology with one or more arts/humanities subject. A minority had taken sciences; 15% taking biology and 12% mathematics. There was little evidence to indicate students had chosen their degree subject to avoid number. Open ended responses identified enjoyment of, and a belief they would do well in, the subject as the main motivators.

Nearly 90% of students said learning surveys, questionnaires and qualitative analysis were part of their degree, while 56% said they also studied statistics. Students were unsure about sociology's status and its value as a degree. Only a quarter believed employers thought sociology to be a good degree but a majority (56.9%) felt a sociology degree would get them a good job even though most thought sociology had less status than physical sciences.

Over 40% reported bad experiences of maths at school and/or regarded themselves as not good at maths. Despite responses endorsing attitude statements indicative of a lack of confidence, there is less evidence of an anti-numeric bias. Just over half the sample expressed anxiety about learning statistics, but less than a quarter thought sociology/politics students should not have to study them. While 41% did not enjoy learning about surveys 42.5% said they did. 64% agreed that they would rather write an essay than analyse data, but the overall pattern showed less resistance to number than had been anticipated from anecdotal evidence.

There is a clear association between a positive attitude toward quantitative methods and achievement in methods modules. Those with a negative

attitude were over twice as likely to get a Third, or fail, than those who expressed positive views, although here we cannot distinguish cause and effect.

Students do not find all quantitative methods difficult, despite any negative views expressed. We could rank their perceptions of difficulty in three categories:

**A:** intuitively understandable and to some extent visual topics, requiring little arithmetic skill (charts, means, frequencies, histograms).

**B:** topics requiring greater conceptualisation/logic and perhaps more confidence with number (correlation, hypothesis testing, standard deviation):

**C:** topics forming a conventional core of basic statistics techniques, requiring better grasp of number and statistical reasoning (Chi-sq, Pearson's, V, t test, z test, Spearman's rho, regression).

Student also commented on various aspects of the learning process: somewhat surprising given attitudes to number, maths ability was considered less important than access to tutors or small classes.

These findings, together with the statements about difficulty levels, are highly relevant to the teaching and learning of quantitative methods. They also indicate further research is needed on postgraduate experience, and on attitudes and choice of methods in early social science careers.

## **Student Perceptions and Experiences of Quantitative Methods**

Malcolm Williams, Geoff Payne, Liz Hodgkinson, Donna Poade,  
University of Plymouth

### **Background**

The research was prompted by concerns about a quantitative methods deficit in output, and teaching and learning, in UK social science. Government concerns have been manifest in ESRC policies for meeting qualified workforce deficits especially in the fields of economics, demography and social policy (ESRC 2000, paras 22-3; ESRC 2001, sections C and D; Diamond, 2004; ESRC 2004), but previous research has been limited. This is the first national study to explore student attitudes toward teaching and learning in quantitative methods

Initial exploratory work in sociology consisted of a content analysis of academic output from leading UK sociology journals, a baseline study of the quantitative curriculum in UK HEI sociology units (Payne et al 2004) and a series of consultations with the teachers of quantitative methods in universities (Williams et al 2004). Whilst the baseline study of curricula indicated that quantitative methods were almost universally taught and accounted in most units for between 11 and 20% of the teaching programme, in each of the other elements there was evidence of a problem.

Consultations at seminars in Edinburgh, London, British Sociological Association Conferences and the ESRC Methods Festival, in 2004 and 2006, found serious concern amongst those teaching quantitative methods: they did not feel supported by their units; they were seen to be separate to the substantive disciplinary curriculum; and there was a disinclination for students to engage with quantitative methods. Although these findings were from self selecting groups and can only be seen as indicative, the results from the content analysis of sociology journals was a census of two years output, clearly indicating a deficit of quantitative output. Only 8.6% of papers reporting on empirical work employed quantification, even at the level of univariate analysis. Moreover, early career sociologists were less likely to use quantification than senior colleagues.

The few other earlier studies support these findings. A Finnish project (Murtonen and Lehtinen 2003) investigated sociology student attitudes to number. In a very small sample, they found that students experienced difficulties with concepts and content and had a negative attitude toward quantitative methods and number. Some students were uninterested in methodology and things mathematical; saw themselves as 'non-mathematical persons', believed that mathematical and linguistic skills are mutually exclusive and that quantitative approaches were not relevant to human sciences. A much larger UK study (Rice *et al* 2001) identified issues making

the use of quantitative secondary analysis of national data-sets in teaching difficult. In particular 'hands-on' computer analysis is confined to methods courses.

## **Research Aims**

The current research, though relatively small-scale, was intended to collect national level data on student attitudes toward quantitative methods, so providing a reliable and valid description of student perceptions of and attitudes towards quantitative methods in sociology and political science<sup>1</sup>. The research had the following objectives:

- i) To investigate student perceptions of sociology and political science as disciplines (e.g. are they seen as closer to humanities or science subjects). How does this relate to subject choices in secondary and higher education?
- ii) To establish whether students have a negative view of quantitative methods (statistics, data analysis, survey design and its execution). If so, to what extent is this produced by perceptions of attitudes among teaching staff and discipline content?
- iii) To investigate student attitudes toward the teaching and learning of quantitative methods.
- iv) To investigate the difficulties students experience in learning techniques of quantitative methods.

The survey and focus groups produced valuable findings in respect of each of these objectives, though data on attitudes toward teaching staff and learning facilities were less conclusive.

## **Methods and Sampling**

Two methods of investigation were used in the research:

- i) A self completion survey of stage 2 and stage 3 sociology and politics undergraduates in English and Welsh HEIs
- ii) Focus groups with stage 2 and 3 sociology and politics undergraduates in three HEIs

Focus groups were held in November 2005. Stage Two and Stage Three students, were asked to reflect on their experiences of quantitative methods so far<sup>2</sup>. Their responses provided the basis for the design of a self-completion survey questionnaire<sup>3</sup> and a useful contextual qualitative data. Additional qualitative data came from open-ended questions in the questionnaire.

The survey was conducted between January and April 2006, consisting of an online self-completion questionnaire administered in English and Welsh HEIs to students in

their second or third year of a three year undergraduate degree. A random sample of 34 units offering major/ single honours sociology/ politics was selected. The sampling units were in both old and new universities and university colleges. All students in scope were sent an explanatory email by a member of staff in their own unit, explaining the study and containing a URL link to the questionnaire. The initial response to the online questionnaire was quite poor and a 'booster' sample of paper-based questionnaires was distributed in 22 of the poorer responding units. The achieved sample was skewed toward males, with 125 males (16.9 % ) and 613 females (83.1%)<sup>4</sup>, but there were no significant gender differences.

The questionnaire (see appendix) focused on student attitudes toward studying quantitative methods, with additional questions on achieved grades and attitudes toward teaching and learning. The questionnaire also asked students about their A-level (or equivalent) choices and choice of sociology at degree level, their views of sociology's status and whether they saw it as closer to the arts/ humanities or science and maths

Data are presented as cross-tabulations because we wanted to offer easy access to co-professionals who may be less confident with number. Within the constraints of the sample size, we intend to use cluster analysis in order to refine the findings further.

## Findings

### *Subject Choice and the study of Quantitative Methods*

The questionnaire asked students about their A level (or equivalent) choices and why they chose to study sociology/ politics at degree level. Among those who had taken A levels 70%<sup>5</sup> had taken sociology and further 35% had taken psychology. Over twice as many students took arts/ humanities A levels as science/ technology<sup>6</sup>. Of the former, 63% took English A level. The most popular combinations included sociology with one or more arts/ humanities subject. A minority had taken sciences with 15% taking biology and 12% mathematics.

There was little evidence to indicate students had chosen their degree subject to avoid number and 78% of them expressed the belief they would enjoy the subject. Just under 45% chose their subject because they got good grades at school. Open ended responses reinforced enjoyment and a belief they would do well in the subject as motivators.

Although the earlier baseline HEI study indicated most sociology students studied at least some quantitative methods (Williams et al 2004), it was considered valuable to ask students what they believed they had studied and when. The findings generally confirm those of the earlier study (Table 1). Nearly 90% of stage 3 students said they

had studied surveys, questionnaires and qualitative analysis. Nearly 56% said they had studied statistics, though nearly 70% had studied quantitative analysis using SPSS or Minitab and almost 90% had studied surveys or questionnaires. Most methods teaching is completed by stage two.

**Table 1 Topics Studied during degree (multiple response)**

	%By Stage 2	%At Stage 3	Total during degree
Focus Groups	37.1	16.4	53.5
Participant Observation	52.5	22.5	75.0
Qualitative Data Analysis	61.7	27.7	89.4
Quantitative analysis using SPSS or Minitab	46.0	23.6	69.6
Sampling	49.0	25.1	74.1
Statistics	34.0	21.7	55.7
Surveys and Questionnaires	62.5	27.1	89.6
Unstructured Interviews	52.7	22.7	75.4
Quantitative Secondary analysis techniques	50.1	24.4	74.5
	n= 733	733	733

*Student perceptions of sociology*

Students were ambivalent about sociology’s status and its value as a degree. Table 2 shows half the respondents unsure about whether employers thought sociology to be a good degree and a further 22.4% believing they did not. However a majority still thought a sociology degree would get them a good job (56.9%), though over one-third were also unsure about this. Nearly two-thirds thought sociology had less status than the physical sciences. These findings suggest the image of sociology may be a confusing one in the student mind. We cannot be sure that these views arise from the inclination of the discipline or teaching and learning within it, but nevertheless there is evidence of an ambiguity of messages here.

We noted above that the majority of the discipline’s academic output inclines toward ‘qualitative’ approaches, but also the findings of the earlier study of quantitative methods teaching (Williams et al 2004: 20) indicate evidence of an anti-quantitative bias in general sociology teaching. Against this, it is the case that most students are taught some quantitative methods, often presented within a teaching and learning rhetoric of ‘transferable skills’ and ‘employability’ (Fallows and Steven 2000). How do students view the apparent contradictions of the discipline presented as qualitative or ‘humanistic’ in the literature and teaching, against the requirement that they study quantitative methods?

**Table 2 Student views of sociology**

	Agree	Disagree	Not Sure
Employers see sociology as a good degree	26.6	22.4	50.8
My degree will help me get a good job	56.9	6.9	36.1
Sociology has less status than the physical sciences	63.1	25.3	11.6

n= 738

These contradictions had been earlier explored in the focus groups. Anxiety about number (which we discuss later) was accompanied by a permissive view of the disciplinary status of sociology and sociological method, exemplified by the following quotes from focus group participants:

*[it depends] whether you want to define it as science and whether you want it to fit into a category of science.....it's whatever you want it to be.*

*..there are sociology courses you can do that I didn't think were part of sociology, they take a very different consideration of sociology...*

*There's two different kinds of academia. There's like the numeric one which is more like the chemistry and physics and maths and stuff.... And then there's the 'words' one, which is English and history and stuff*

The interviewer then asked where sociology fits into this:

*It depends which angle you take in sociology doesn't it ...*

Yet despite this apparent awareness that sociology could be scientific under some circumstances, there was also no doubt that in the sample overall students strongly believed sociology to be closer to the arts/humanities. An aggregation of a ten point semantic differential scale, on which students indicated whether they thought sociology closer to the arts/ humanities or science indicated that 71% scored toward the arts/humanities end of the scale, 14.5% the science end of the scale, with the remainder choosing the middle category.

### *Do students have a positive or negative view of quantitative methods?*

The overall impression is that whilst most students are not wholly comfortable with quantitative methods, they do see a need for them in sociology. Students were presented with a series of attitude statements about number in a Lickert scale and asked to indicate their agreement/ disagreement with these. These are presented in the first numeric column of Table 3 (discussion of the academic performance data follows, below).

The attitudes summarised in the column headed 'Students' Views' indicate a lack of confidence in number. Forty three per cent of students said they had had a bad experience of maths at school<sup>7</sup>. A similar number (41.9%) regarded themselves as not good at maths and just over half (52.4%) expressed anxiety about learning statistics. This needs to be put in the context that most students studying sociology in English and Welsh universities must pass a GCSE (or its equivalent) in Mathematics.

Though there is evidence of a lack of confidence there is less evidence of an anti-numeric bias. Less than a quarter thought sociology/ politics students should not have to study statistics or agreed that 'using statistics detaches you from your research project'. Around equal numbers trusted or distrusted statistics, though evidence of distrust may indicate a healthy scepticism rather than outright rejection.

This suggests a reluctant acceptance of the need to study quantitative methods rather than an outright rejection of number, the view expressed by methods teachers in the earlier consultations (Williams et al 2004). However, 41% of students did not enjoy learning about surveys and only slightly more (42.5%) said they did. A firmer indication of a preference for more discursive work was that 64% agreed that they would rather write an essay than analyse data.

In the focus groups we explored why students preferred non-quantitative work but nevertheless accepted the need for quantitative methods. There was evidence of a science versus arts/humanities split, with a minority of students who favoured the former expressing the view that they 'knew the rules, knew what to do' and that it was a 'relief' to do quantitative methods because it was definitely 'right or wrong'. However, for most, getting through statistics and quantitative methods was a necessary but unappealing process made harder by a perceived lack of enthusiasm by those teaching quantitative methods. Indeed this comment was voluntarily offered by some students in open-ended questions in the survey.

**Table 3<sup>1</sup>. Student Views of Quantitative Methods and Achievement in Research Methods**

	<i>Student View</i>	<i>N=</i>	<i>% fails or 3rds (0-49%) in research methods assessments taken</i>	<i>% 1sts or 2.1 in research methods assessments taken</i>
<b>Had a bad experience of maths at school</b>				
Agree	42.9	279	16.1	45.6
Disagree	50.1	328	9.8	58.5
Not sure	6.6	43	14.0	48.9
<b>On the whole not good at maths</b>				
Agree	41.9	274	15.7	46.3
Disagree	44.1	288	8.3	60.8
Not sure	13.9	91	17.6	44.0
<b>One of the reasons I chose this degree is because I don't like maths</b>				
Agree	19.2	126	23.0	38.8
Disagree	75.0	491	9.2	56.2
Not sure	5.6	37	24.3	45.9
<b>I didn't expect to have to do so much number work</b>				
Agree	44.0	288	17.0	45.5
Disagree	46.6	305	8.9	60.7
Not sure	9.3	61	11.5	42.7
<b>I don't think sociology students should have to study stats</b>				
Agree	23.7	155	24.4	34.8
Disagree	69.7	455	8.8	58.2
Not Sure	12.7	83	18.0	43.4
<b>Learning statistics makes me feel anxious</b>				
Agree	52.4	342	17.8	46.5
Disagree	38.8	253	7.2	60.4
Not Sure	8.7	57	7.0	52.6
<b>I Enjoyed learning about surveys</b>				
Agree	42.5	277	7.6	58.5
Disagree	41.0	267	18.7	43.1
Not Sure	5.1	107	11.2	58.9
<b>I'd rather write an essay than analyse data</b>				
Agree	64.0	418	15.7	47.6
Disagree	19.1	125	11.2	60.0

Not Sure	16.8	110	2.7	60.9
<b>Using Stats detaches you from your research topic</b>				
Agree	21.7	142	21.2	40.1
Disagree	59.5	389	8.5	58.9
Not Sure	18.8	123	16.8	54.5
<b>On the whole you can't trust statistics</b>				
Agree	44.1	288	8.3	60.8
Disagree	41.9	274	15.7	46.3
Not sure	13.9	91	17.6	44.0

P= <0.05

<sup>1</sup> The statements were presented as a 5 point Lickert scale, but have been aggregated into a 3 point scale in order to achieve the same significance level in each question.

### *Student performance in research methods*

Table 3 also explores the relationship between attitude toward quantitative methods and achievement in the methods modules the students had so far taken. The third column in the table aggregates Fails and Thirds in these modules, while the final column aggregates Upper Seconds and Firsts.

Except for the final attitude statement about 'trusting statistics' there is a clear association between a positive attitude toward quantitative methods and achievement in methods modules. Students viewing number and quantitative methods more positively were more likely to obtain Upper Seconds or Firsts and less likely to fail or obtain a Third Class mark. The opposite was true for those who expressed a negative attitude, or fear of number. The differences are often quite pronounced: on some measures, those with a negative attitude were over twice as likely to get a Third, or fail, than those who expressed positive views. Conversely those expressing lack of trust in statistics were more likely to get marks in the higher classifications and less likely to get a Third, or fail. This seems to add weight to the view expressed above that scepticism about statistics does not necessarily equate with a negative view of their use. The present data do not permit us to decide whether negative attitude produce poor marks, or poor marks produce a negative attitude (or indeed whether there is a complex interaction between the two). It seems plausible that both processes are at work: this would certainly seem to be an avenue worth exploring in future studies.

We did explore, albeit in a somewhat crude way whether there was any relationship between overall student ability and performance in research methods. We do not hold any individual level data on student ability or individual entry qualifications. Instead, we used an area level proxy for prior ability, the UCAS entry level points for the sociology course in the sample institutions of higher education, to enable us to explore whether there is any relationship between this measure and student performance in research methods. (We present these data more as an indicator of a fruitful area to investigate than definitive results. Indeed the proxy used is doubly limited by being at the area level and by treating A level grades as a valid indicator of ability to perform at degree level).

The results from this cross-tabulation, in Table 4, show a clear relationship between achievement and UCAS entry points. Those courses requiring 340-260 were more likely to have students achieving First or Upper Second class marks and less likely to have students failing research methods modules than those universities with a lower entry tariff for sociology. The lowest band had the highest percentage of Fails, though interestingly those in the lower band were more likely to achieve Firsts or Upper Seconds than those in the middle band (which may be a by-product of recruitment policies geared to mature students). Cross-tabulations (not shown here) of UCAS tariff points by attitude statements showed a significant positive relationship between the highest UCAS point band and positive view of number. It would be erroneous to claim from this that better performing students are more positive about number, but again this may be a question worthy of further investigation.

**Table 4. Performance in Research Methods marks by Course entry requirements**

UCAS entry points	Research Methods Marks					Total	All
	0 -39%	40-49%	50-59%	60-69%	70%+		
340- 260 points	3.8	7.1	30.4	47.2	11.5	451	637
240 - 200 points	2.6	15.7	47.7	28.8	5.2	153	
180 - 120 points	6.1	3.0	42.4	39.4	9.1	33	

P= <0.00

*Student attitudes and difficulties experienced in learning of quantitative methods.*

The survey and focus groups explored student views on what they found difficult or easy in research methods and what kind of things would improve the quality of their learning. Unsurprisingly a majority of students (51.6 per cent) found quantitative methods in general more difficult, 12% took the opposite, and 35.6% found each equally difficult. Those finding quantitative methods more difficult were nearly 3 times as likely to fail research methods modules. Conversely those finding quantitative methods easier were over twice as likely to achieve First Class marks.

We also asked students whether they had studied a range of statistical techniques and how difficult they found each. More 'difficult' techniques were studied by fewer students and would, in some universities, only feature in more advanced and (often) optional quantitative modules, so many students do not even attempt them. It seems quite possible that this opt-out arises from a negative view of and/or poor performance in quantitative methods. Nevertheless, students do not find all quantitative methods difficult, despite any negative views expressed.

The results are shown in Table 5, ranked by perceived level of difficulty, which might be expressed as follows:

**Group A:** intuitively understandable topics requiring little arithmetic skill and to some extent visual (charts, means, frequencies, histograms).

**Group B:** topics requiring greater conceptualisation/logic and perhaps more confidence with number (correlation, hypothesis testing, standard deviation):

**Group C:** topics that form a conventional core of basic statistics techniques requiring better grasp of number and the internal logic of statistical reasoning (Chi-sq, Pearson's, V, t test, z test, Spearmans rho, regression).

**Table 5 Difficulty of Statistical Technique**

		Easy	Hard	N= <sup>1</sup>
Group A	Bar charts/ pie charts	94.6	5.4	626
	Mean/ Median/ Mode	92.0	8.0	636
	Sampling	84.0	16.0	583
	Frequencies	79.9	20.1	556
	Histograms/ Scattergrams	79.8	20.2	526
Group B				
	Correlation	73.2	26.8	570
	Hypothesis testing	63.8	36.2	486
	Standard deviation	59.3	40.7	543
Group C				
	Chi Square	46.6	53.4	335
	Pearson's r	45.5	54.5	231
	Cramers V	45.3	54.7	139
	Z tests	44.7	55.3	150
	Spearmans rho	42.5	57.5	200
	Regression	40.1	59.9	227

<sup>1</sup> Total number who said they had studied the topic.

The research also explored the importance of certain features in teaching and learning to students. They were asked to indicate on a ten point scale (where 1 was unimportant and 10 very important) how important particular feature of teaching and learning were. Each feature was considered important by a sizeable number of students, though somewhat surprising given attitudes to number, maths ability was considered less important than access to tutors or small classes.

**Table 6 Importance of teaching and learning characteristics**

	Unimportant				↔		Important				N=
	1	2	3	4	5	6	7	8	9	10	
Chance to actively engage in class	9.4	2.3	4.1	7.0	14.2	7.3	14.7	17.2	8.1	15.6	681
Small classes	7.0	0.9	3.8	3.8	9.7	6.2	11.0	21.7	15.0	20.9	681
Having some maths ability	5.7	1.6	3.2	4.1	14.0	14.8	18.4	16.7	10.3	11.2	681
Regular feedback	6.2	0.7	1.0	2.5	4.4	7.2	13.7	22.5	19.1	22.8	681
Access to tutors	6.0	0.7	1.5	1.5	5.4	3.8	8.8	14.9	23.4	34.0	680
Access to 'online' teach yourself materials	7.2	1.9	4.4	4.6	10.9	9.3	13.1	14.7	15.1	18.9	685

## Conclusion

The research reported here is from a relatively small scale project, but its significance lies in it being the first national study in England and Wales to explore social science students' attitude toward number. It therefore provides solid evidence to replace previous anecdotal experience.

Though there is evidence that a sizeable minority of students enjoy quantitative methods and do well in research methods modules, there are indications of a large degree of concern amongst students about their own abilities. Perhaps more worryingly is evidence of an 'anti-quantitative' mindset. Two-thirds of our respondents preferred writing essays to data analysis: many were sceptical about the advantages of quantitative techniques, preferring qualitative or humanistic approaches. Though most students claim to have studied quantitative methods, we do not know to what extent they actually use them or indeed the depth of learning. Could the present climate of resistance led to a 'dumbing down' of pedagogic content?

Two other important findings emerged. First, a positive attitude and confidence are associated with better performance in research methods. We cannot know from this whether the performance/attitude association indicates causation, or even a vicious/virtuous circle between results and attitudes, but is clearly important for pedagogy and student progression. Second, there is a 'hierarchy of difficulty' – not all quantitative methods are of equal difficulty in the student mind. This is without doubt a topic that needs further research because of its importance for what, and in what order, new ideas are presented to students.

The current research was concerned only with undergraduates, but there is also further work to do on what kind of methods choices postgraduates and early career researchers make and why they make them. Do these methodological choices have a basis in their undergraduate experience, or are these choices based on later experience?

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## Notes

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<sup>1</sup> Only 37 politics students responded in the survey. Their characteristics are virtually identical to the sociology students, so it was decided they should be kept in the analysis.

<sup>2</sup> 2 groups were conducted in a pre- 1992 university, 2 in a post 1992 university and 2 in a CHE.

<sup>3</sup> In addition the rating scales were developed from already-tested instruments used in measuring perceptions and stereotypes of subject disciplines and fields of knowledge e.g. Weinreich-Haste, 1981 and 1986; Archer and Freedman, 1989

<sup>4</sup> The survey achieved a response rate of 18.2 %. A low on line response rate (12.8%) prompted us to boost the sample through a paper based self completion questionnaire in some of the low responding units. A comparison of the on line and paper based responses indicated little variation in student characteristics or responses. We accept that non respondents could be different to

respondents, but given that the follow up paper based survey was to those who originally did not respond and that these students share similar characteristics to the on line sample, we have some confidence that there may not be large differences between responders and non responders.

<sup>5</sup> 86.3% of respondents had taken A levels

<sup>6</sup> Of all those who took at least one A Level. Psychology was excluded from either category.

<sup>7</sup> Without comparative data for those studying other subjects we cannot know whether this is high or low, although of course if other subjects did experience such a high level of negativity toward maths it may indicate a wider problem with school mathematics.